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Y12 7s/Clean Sweep Benchmarking: LANL Overview

June 2014

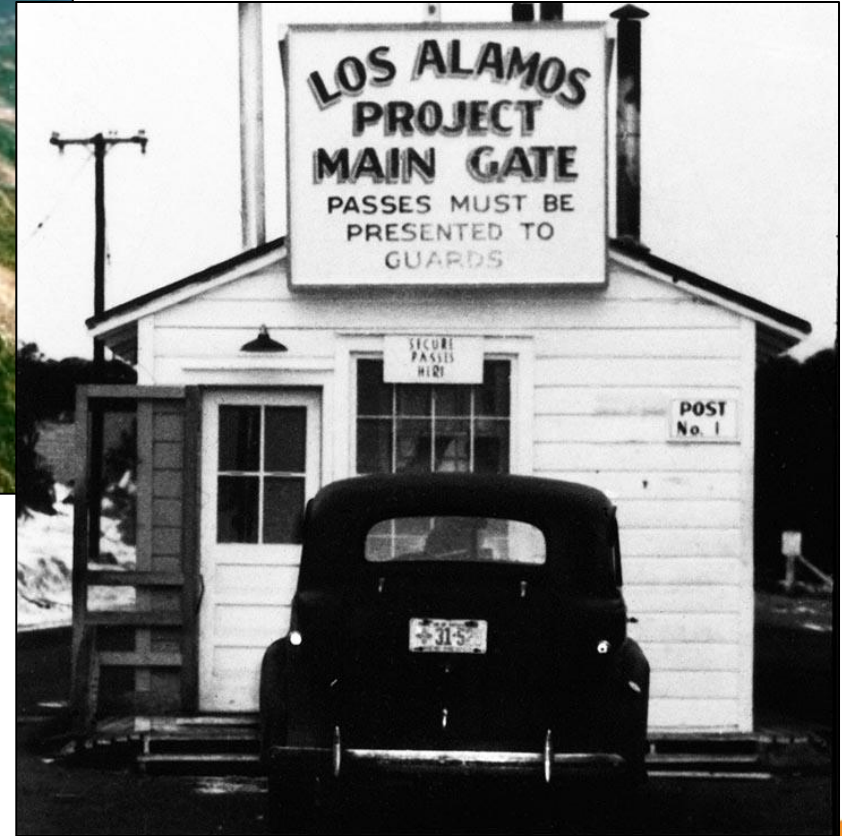
Outline

- Overview of LANL Site
- Approach to Environmental Stewardship
- Programs Supporting Environmental Goals
 - UMCs
 - Moratorium Metals
 - Site Cleanup
 - Workspace Stewardship
 - P2
 - Site Sustainability Plan
- Questions?

Los Alamos National Laboratory



- ~100 mi north of Albuquerque (closest major airport)
- 70+ yrs of operations
- 40 mi² & 30+ active technical areas
- 9000+ permanent employees



Selected Environmental Aspects

- Limited Water supplies
- Cultural/Historic Resources
 - ~2000 cultural sites & 5500 yrs of human history
 - Manhattan/Cold War Area NHPA sites
- Disposition of items/materials from legacy missions
- Resource Use
 - Everything trucked in/out
- Commuting/GHG Emissions
- Power Generation/Energy Consumption
- Wildland fire
 - 2000 Cerro Grande – 48,000 acres, 400+ homes, 40 LANL structures
 - 2011 Los Conchas – 150,000+ acres, 60+ homes
- Flash-flooding
 - Post-wildland fires
- Radiological / Hazardous / Mixed wastes and materials



Approach to Environmental Stewardship

June 2014

Over-View of Environmental Stewardship At LANL



Long-Term Strategy for Environmental Stewardship and Sustainability

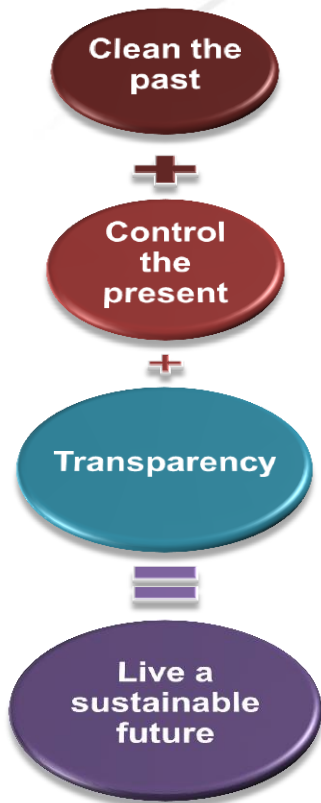
Be the sound environmental stewards required for accomplishing our national security mission.

Protect human and environmental health by

1. Cleaning up or stabilizing historical releases to the environment
2. Controlling current programs to ensure an impact to the environment which is as low as reasonably achievable and
3. Creating a sustainable future through pollution prevention, waste elimination, energy and water conservation, and fostering resilient ecosystems.

The strategy looks from two linked perspectives

1. A broad-reaching vision to set long-term environmental goals.
2. A day-to-day examination of decisions to choose those actions that are most protective.



Environmental Grand Challenges



Remove or stabilize pollutants from the Manhattan Project and Cold War eras.



Protect water resource quality and reduce water use.



Eliminate industrial emissions, discharges, and releases to the environment.



Protect human and environmental health by managing and restoring lands.



Produce zero radioactive, hazardous, liquid, or solid wastes.



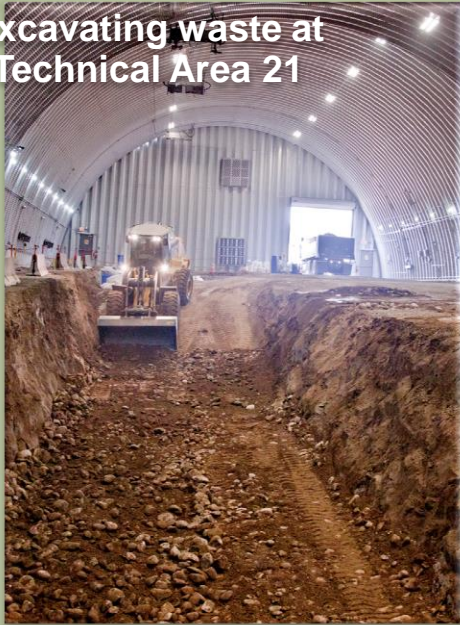
Use energy efficiently while creating sustainable energy sources.



Collaborate with our stakeholders and tribal governments to ensure that LANL's impact on the environment is as low as reasonably achievable.

Protections = Defenses in Depth for Protecting Human and Environmental Health

Excavating waste at
Technical Area 21



Remove the Source

Sediment Retention
Pond



Stabilize or remove
sediments

Groundwater Sampling
in Mortandad Canyon



Measure for known and
unexpected contaminants

Anticipate, recognize, evaluate, control and mitigate
emerging environmental challenges

We're Addressing Significant Environmental Priorities



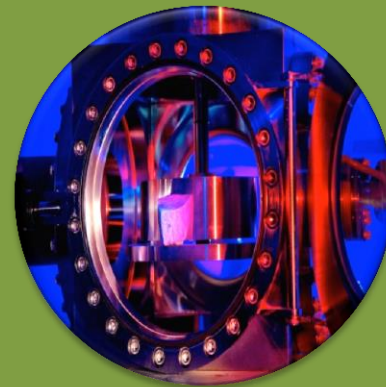
Clean Up the Past

- Remove transuranic waste stored above ground
- Mitigate contamination in groundwater
- Protect groundwater from contamination
- Keep contaminants on site
- Prevent contaminant transport to the Rio Grande
- Ensure regulatory compliance
- Remove and stabilize contaminants in soil



Control the Present

- Identify risks and take action
- Plan for future waste disposal options
- Implement pollution prevention solutions
- Manage risk using our ISO 14001 certified Environmental Management System (EMS)
- Operate in compliance with environmental laws, regulations & DOE orders
- The mission is inseparable from environmental stewardship



Live a Sustainable Future

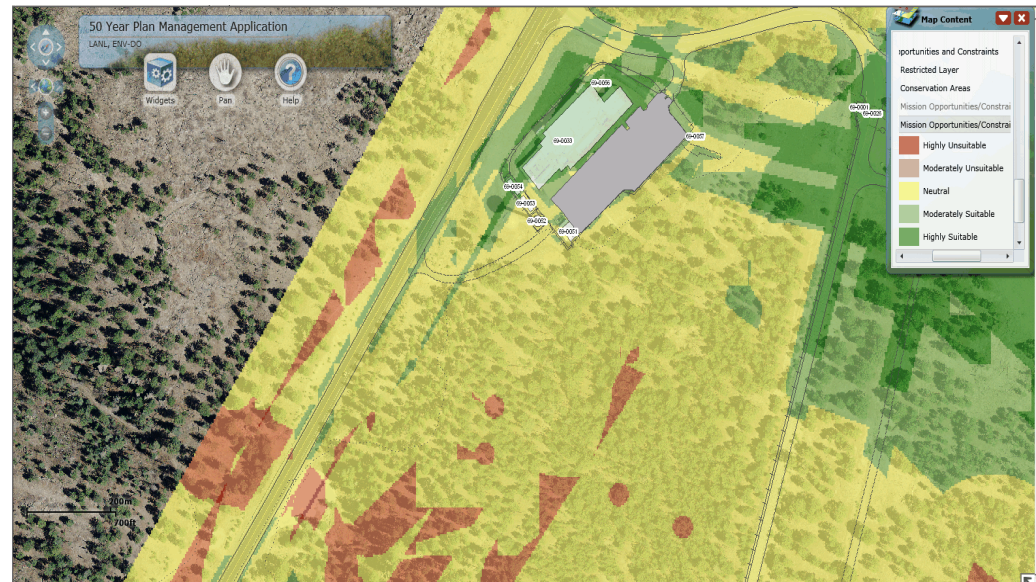
- Conserve water and ensure adequate supply
- Conserve electricity and increase use of renewable energy
- Mitigate secondary impacts from climate change such as habitat degradation
- Protect environmental and human health

Future Stewardship Integrated Today



Analyzing Environmental Impacts: Decision Support Application (DSA) & Permits Requirements Identification (PRID) Tools

- DSA (right) analyzes 60 map layers and alerts users to potential environmental and infrastructure interactions
- PRID analyzes safety, security & environmental / cultural / historic bld interactions
 - Designed to work like Turbo tax - Interactive Q&A
 - Automatically alert SMEs to potential interactions





Unneeded Materials & Chemicals (UMCs)

June 2014

No Inventory

- UMC directive from DOE not included in LANL Prime Contract until third quarter FY12
- New Prime Contract language directs LANL to report disposition statistics each December, but requirement to inventory all unneeded items is not included
 - Metrics collected from P2, Moratorium Metals, Site Sustainability, Property Management, Footprint Reduction (aka facility D&D), and Site Cleanup Programs and summarized in report



Site Cleanup & Workspace Stewardship Program

June 2014

Site Cleanup & Workspace Stewardship Programs

- Upper Management recognized need to:
 - Clean out areas where unneeded (legacy and abandoned) items have accumulated
 - Implement “managed storage” in areas that will be used as storage (e.g. transportainers, sheds)
 - Use the principles of 5s to implement and sustain good house-keeping practices in operational spaces
 - Follow up / Validate
 - Cleanup, sustain and prevent
 - FY14 first year – limited funding and a lot of opportunities

Progress

- May FY13 – Bench-marking with Y12
- June FY13 – Two storage areas designated as cleanup pilots
- Aug FY13 – Institutional EMS Objective to address legacy items and materials adopted by Senior Managers
- Sep FY13 – Site Cleanup & Workspace Stewardship Programs launched and funding for FY14 projects set aside
- Oct FY14 – Lessons learned from pilots lead to the development of “managed storage” agreements
- Dec FY14 – Kick off of four FY14 Site Cleanup Projects
- Mar FY14 – Draft policy/performance expectation vetted with Senior Mgt
- May FY14 – Kick off 5s pilot in Cultural Resource Management workspaces
- 2nd qtr FY14 – Footprint Reduction, Site Cleanup, Pollution Prevention and Site Support prepare integrated call for proposals for FY15 projects
- Developing Quarterly focused cleanup events

FY13 Pilot Cleanup Projects

TA46 Xportainers

- Unneeded programmatic equipment
- Dispose of non-reusable structures
- Site new structures



TA46 - BEFORE

TA51 Yard, Trailers, and Xportainers

- Expensive, reusable drilling equipment and other unneeded items
- Excavate and D&D partially buried trailers
- Organize xportainers and yard



TA51 - BEFORE

TA46 After Photos

- Mitigation of multiple pest hazards, including rodent nests and feces
- 30 burn boxes
- 6 truck-loads to salvage
- 13 boxes of glass items
- 15 paper recycle bins
- 5 loads of metal recycles
- Disposition of hundreds of chemicals
- Identification and destruction of 5 high risk instruments



TA51 After Photos

- 2 truck-loads of wood to recycling
- 1 roll off of scrap metal to recycling
- 3 truck-loads of drilling rods/pipes to salvage
- 3 truck-loads of metal parts to salvage
- 5 dumpster loads to sanitary waste
- ½ truck-load of non-reusable cement to concrete washout
- Mitigation of rodent nests and feces measured in inches to feet
- 1 entire drilling rig & selected rods for internal lab reuse



FY14: TA69 Legacy Outdoor Experimental Site Cleanup

- Abandoned after Cerro Grande Fire
- Utilities and communication disconnect, excavation/removal of buried and surface equipment, PVC casing from wells, metal fence posts, metal tubes, PVC pipes, uni-strut, batteries, sump pumps, concrete pad
- Level site and reseed to conform with surrounding area
- Prevention – EES commitment to developing appropriate project closure strategies for all new and active outside experimental sites



FY14: EPICS Spectrometer and Magnet Pad Cleanup



- Dismantle remaining spectrometer, electromagnets and associated equipment
- Cleaned area to be reused for high power beam experiments
- Moratorium Metals technical approach pilot
- Legacy storage areas decommissioned
- Designated storage areas clearly marked and managed

FY14: TA33/39 Cleanup



- Clean two permanent structures
- Dispose of legacy equipment
- Prepare one (historical) structure for long term surveillance and maintenance (i.e., cool & dim)
- Prepare one structure for re-occupation by new org



FY14: Transportainer Cleanup & Removal



- Sort/segregate equipment and material for salvage/recycle, disposal or trash
- Consolidate needed items into two transportainers and implement managed storage
- Permanently remove five transportainers

FY14: Transportainer Cleanup & Removal (After)



Concept of Workspace Stewardship Institutional Document Approved & Doc Now In Draft



- General Housekeeping
- Managed Storage
 - Temporary storage structures assigned to custodians in Lab property management database
- Real-Time Disposition of Unwanted Items
 - Reuse → Recycle → Disposal
- Vacating / Occupying Space

Draft General House-Keeping Requirements

- Workspaces, storage areas and outdoor jobsites/spaces shall be kept clean and organized to the extent that the nature of on-going work allows.
 - All jobsites and workspaces free of pests and associated hazards
 - All items have labelled and designated storage areas
 - Hazardous materials, chemicals, tools, equipment, supplies, spare parts, in ESH-compliant storage areas when not in use and at the end of each workday
- Wastes and unneeded tools, equipment, supplies, spare parts, materials or chemicals are compliantly dispositioned at the end of each job, activity or project
- Hallways, walkways, docks, kitchens, and other common areas kept orderly and not be used as *de facto* storage areas

Draft Managed Storage Requirements

- Formally designate storage areas
- Assign 1 custodian and 1 alternate
 - Assigned structures in Lab property management database
- Label designated storage areas with the current contact information
- Lock and limit access
- Label all stored items with owner's current contact info
- Formally transfer storage areas when custodians are re-assigned
- Walk-down designated storage areas at least annually to identify and address hazards and to re-evaluate the need for continued storage of items and materials

Vacating / Occupying Space

- Existing process to be revised and reissued
- Vacating employees held accountable for cleanliness of workspaces and for dispositioning items
 - First line managers walk cleaned workspaces before employee leaves
- Employees accepting/occupying workspaces accept conditions and contents of workspaces
 - First line managers confirm acceptances



Moratorium Metals

June 2014

Scope

- Much is not contaminated and some activated with only short-lived radioisotopes with short-term (10-15 yr) decay
- Cost of continued disposal as municipal / mixed wastes is high for all DOE sites

Selected DOE Sites	Low Range (as reported to EFCOG)	High Range (as reported to EFCOG)
Argonne National Laboratory	\$3,405,000	\$9,675,000
Brookhaven National Laboratory	\$3,405,000	\$9,675,000
Fermi National Accelerator Laboratory	\$1,702,500	\$4,837,500
Idaho National Laboratory	\$6,810,000	\$19,350,000
Los Alamos National Laboratory	\$6,810,000	\$19,350,000
Livermore National Laboratory	\$3,405,000	\$9,675,000
Nevada National Security Site	\$6,810,000	\$19,350,000
Oak Ridge National Laboratory	\$3,405,000	\$9,675,000
Y-12	\$3,405,000	\$9,675,000
Princeton Plasma Physics Laboratory	\$3,405,000	\$9,675,000
Sandia (New Mexico)	\$3,405,000	\$9,675,000
Savannah River Site	\$6,810,000	\$19,350,000
Stanford Linear Accelerator Lab	\$3,405,000	\$9,675,000
Thomas Jefferson Accelerator Lab	\$3,405,000	\$9,675,000

Progress



TA54 Boneyard Before & After: Metals disposed as municipal or mixed waste



- Moratorium metals disposed as municipal or mixed waste prior to FY14
- Technical approach developed in FY14
 - FY14 EPICS/Magnet Site Cleanup Project used as a pilot for Technical Approach

135 Ton EPICS Spectrometer Magnet & 10 Tons of Associated Copper

- Remained in very large experimental area after previous cleanup because of size
- Impedes proposed new projects
- D&D Funded by Site Cleanup Program in FY14 and used to test moratorium metals technical approach





P2 and Site Sustainability Plan

June 2014

FY13 P2 Outcomes

- \$10M in cost savings
 - Fewer deaths of songbirds caused by LANL-owned equipment
 - Avoided printing over 350,000 pages and the creation of over 100 boxes of records
 - 20% reduction in number of Hazardous Waste Site Accumulation Areas
 - Reduced purchases of solvents, paint, aerosols, silica gel, adsorption columns, sulfur hexafluoride, and liquid nitrogen
 - Recycled hundreds of batteries, 27,000 feet of copper cabling, hundreds of cubic meters of metal, over 11,000 wooden pallets, 350 gallons of ARAKLEEN solvent, and 10 cubic meters of circuit boards and capacitors
 - Avoided the generation of 30m³ of electronics mixed low-level waste and 65 kilograms of depleted uranium
 - Recovered over 2000 pounds of refrigerants for reuse by the Department of Defense
 - Reduced energy use onsite by at least 720 megawatt-hours

P2 – Recycling Progress

- Changes in Los Alamos County recycling program lead to additional options for LANL
- Now ALL plastics (1-7), previously only #1 and #2, and limited amount of #5 were recycled
- Mixed paper now includes items such as cereal boxes, junk mail, magazines, newspaper, books, plastic bags, food containers, and all forms of cardboard
- All items are collected in current recycle bins in a “mixed fashion”, sorting takes place at the recycling vendor’s site
- Metal Recycling options are increasing, due in large part to piloting of free release survey protocol for radiologically impacted metal
 - Continuing to seek opportunities to increase reuse or recycling of lead and precious metals

P2 – Electronic Toolkit

Purchasing



I need to buy stuff. How can I purchase sustainably?

Generating Waste



Can I generate waste? What should I do with it?

Energy, Water & Resource Conservation



How do I save money by conserving resources, like energy or water?

Engineering Planning



I'm doing project and work planning. What should I know?

Recycle, Reuse & Clean Fill Resources



Can this be reused or recycled? What about dirt?

Learn from Success



What has been done before? How do I find out?

High Performance Sustainable Buildings

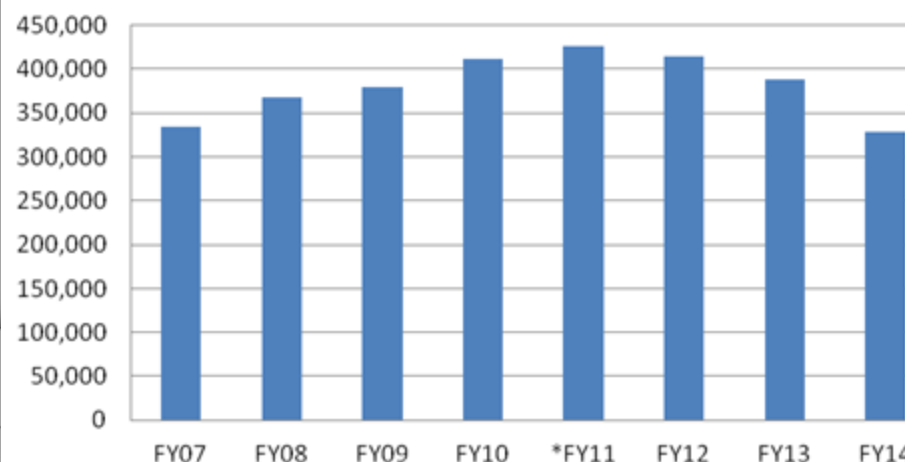


Do I work in a high performance sustainable building? What does that mean?

Water & Energy Reductions

- Increase in water use of only 2.5% compared to the FY 2007 baseline year despite increases in operational demands

LANL Total Water Use (mg)



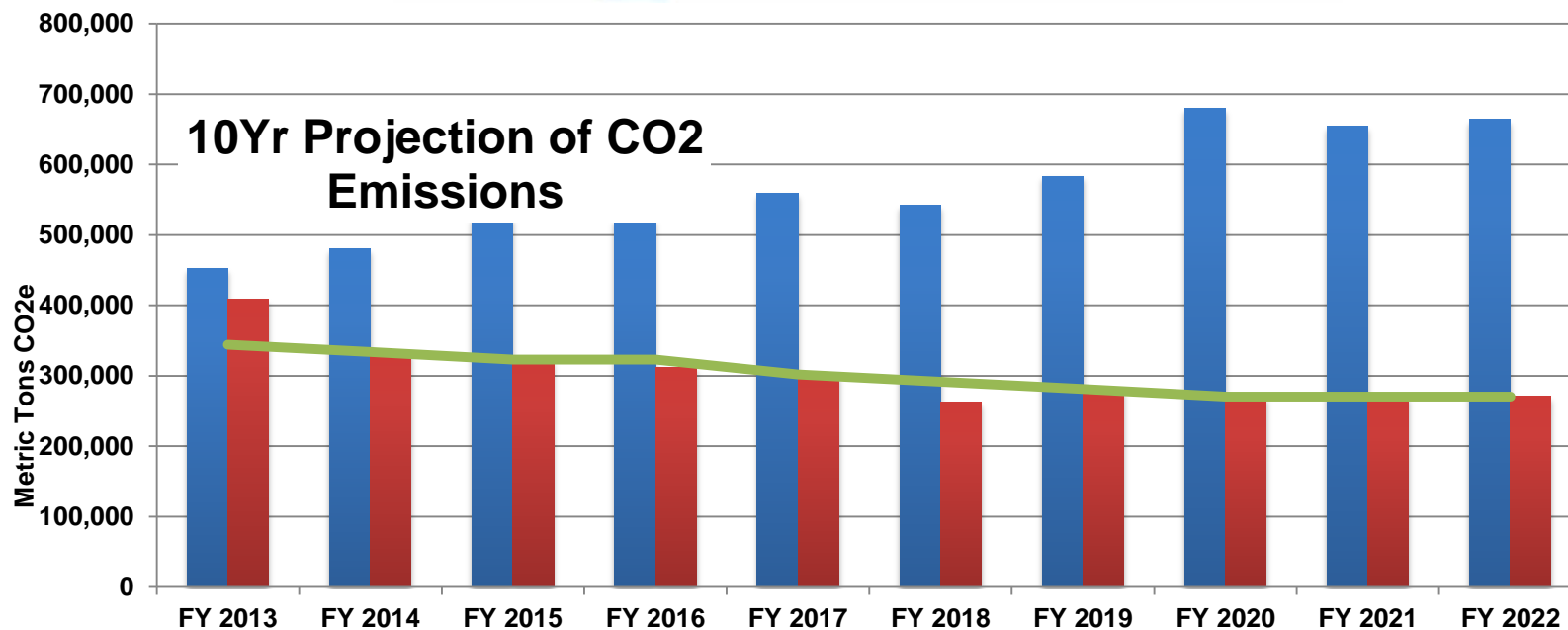
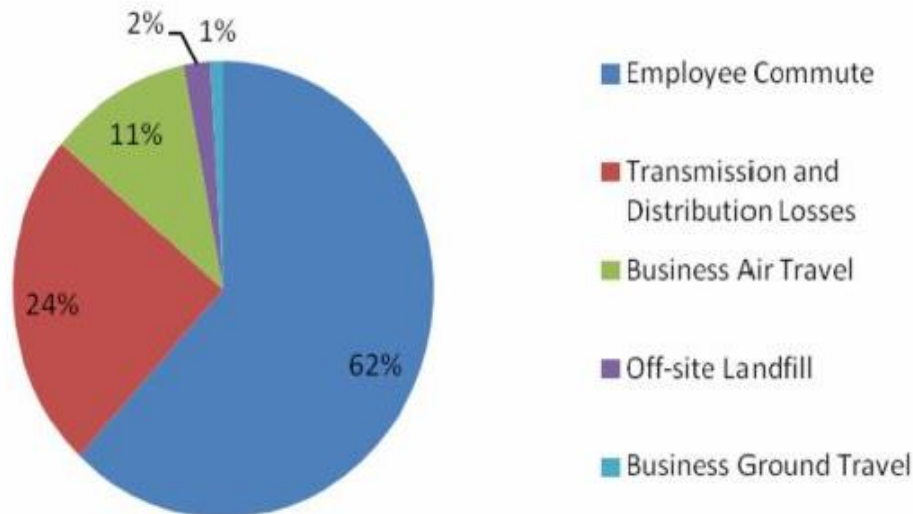
LANL Energy Intensity % Reduction



- Energy intensity has reduced by 18.1% compared to the baseline year of FY2003

GHG

FY 2012 LANL Scope 3 GHG Emissions



Future Projects

- Energy/GHG
 - Power Substation replacement (proposed 2015)
 - Electric Distribution System Upgrade (proposed 2018-19)
 - HVAC Re-commissioning/Building Automation System Upgrades
 - Purchase Renewable Energy & Renewable Energy Credits
 - Promote mass transit, car pools & other commuting alternatives
- Water
 - Air-cooled chillers in small cooling towers
 - Chemical treatment in large cooling towers
 - Leak repair and additional water metering
 - SERF Operations

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